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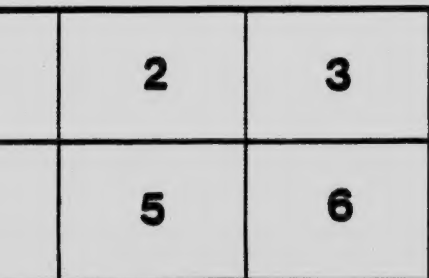
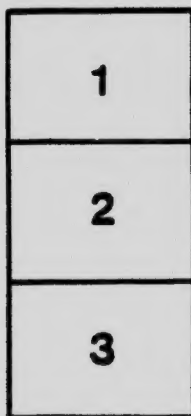
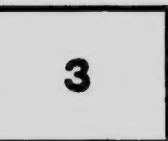
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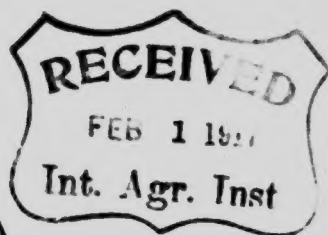
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CIRCULAR No. 2.



PROVINCE OF BRITISH COLUMBIA.

DEPARTMENT OF AGRICULTURE (HORTICULTURAL BRANCH).

COMMERCIAL ONION-CULTURE.

By P. E. FRENCH, B.S.A., ASSISTANT HORTICULTURIST.

THE onion is one of the most important vegetable crops. In the districts of the Delta and Chilliwack, Armstrong, Vernon, and Kelowna, growers making this crop a specialty now ship numbers of straight car-loads every year. Crops from the first two mentioned points go largely to the local markets, the Coast onion not being a particularly good shipper for Prairie trade. The Interior-grown product goes to local markets also, but principally to the Prairies. Only the main crop mature bulbs so far are being grown, though there is an opportunity for development of the trade in pickling-onions, onion-sets, and the large Spanish types, such as Prizetaker and Gibraltar.

The large profits resulting from skilful culture on reasonably suitable land have made onion-growing popular with those holding limited tracts, especially among young orchard trees, while truck-growers in localities particularly adapted, both as to soil and climate, to onion-culture have found the business profitable in larger areas.

The market is generally good. Even against the duty into Canada of 30 per cent, *ad valorem*, we import about 75,000 bushels annually. The f.o.b. price at Okanagan points for a number of years past has averaged about \$20 per ton for Yellow Danvers in 100-lb. bags. As a general rule, the price increases during the winter months, but lack of storage facilities and the danger of frost in transit have prevented any great development of storage business. Prices, nevertheless, have been highly remunerative, and the market is steadily increasing.

THE NEW METHOD OF ONION-CULTURE.

There has recently arisen a method of culture in which the seed is sown in February or March in hotbeds and the plants set out in the field in May, when about the size of a lead-pencil. The advantages of this method are:—

- (1.) Less seed is required;
- (2.) There is a more uniform crop and the expenses of weeding and thinning are almost entirely obviated; and

(3.) The crop is harvested earlier.

The disadvantages are the cost of labour entailed by transplanting, and the cost of the preparation of suitable hotbeds. Where soil is not well prepared, or moisture becomes deficient in August, or where labour is reasonably inexpensive, this method is worthy of consideration, but is not used at present in this Province.

THE OLD METHOD OF ONION-GROWING.

Used almost altogether in the Province for commercial purposes, this does sufficiently well, especially in the districts above mentioned, where a long growing season, suitable soil, and a knowledge of the requirements of the business combine to make it a success.

SELECTION OF SOIL.

The selection of soil is of the greatest importance, as it will not pay to grow onions on poor soil. The mechanical condition of the soil is of first consideration. Heavy clay soils should be avoided because they are difficult to work, usually deficient in organic matter, and often improperly drained. They cannot be worked as early in the spring as is desired, and the surface bakes and cracks after a rain unless stirred at the proper time.

Soils rich in decomposed vegetable matter are the most valuable for the cultivation of onions. A rich sandy loam is a very good soil, especially where irrigation is practised. A black-muck soil that has been well drained is one of the best soils for onion-culture. It has the power of retaining moisture which is so essential to the growth of onions. Fields which have been overrun with weeds should be used for other crops before planting with onions.

THE SEED.

The seed should be of the very best quality to obtain the best results. Do not buy seed because it is cheap. The cost of seed is very small compared with the other expenditures in growing a crop of onions. It is always best to test the vitality of the seed before planting each year, a very good method being to place a few seeds in a damp woollen cloth or moist cotton, and note the number germinating. Order the seed early, because you are then sure of getting the firm's best quality.

VARIETY TO GROW.

This depends almost entirely on the market to which you are catering. The onion to grow is the one which will command the highest price on the market. As a rule, this is an onion hard and compact in structure, mild and sweet in flavour, with a thin skin, small neck, and as nearly globular in form as possible. It should also be bright and handsome in appearance, productive, and of superior keeping quality. As a reliable market variety, to be grown in the old way, and for general purposes, the Yellow Danvers has probably not yet found its equal.

FERTILIZING.

Barnyard manure is indispensable unless the soil naturally contains a large amount of humus. It should be ploughed under in the fall unless very well rotted, when it might be applied on the surface and harrowed in. If

applied on the surface when not well rotted, it has a tendency to hinder the working of the seed-drill and wheel-hoe. A good heavy dressing (15 to 20 tons per acre) every three or four years gives very good results. Hen-manure (1 ton per acre) is very highly recommended for onions. It will produce the best results when applied as a top dressing before planting. Onions require a manure fairly rich in potash. Care should be taken that all manures used are free from weed-seeds. Coarse manure should not be used, as it keeps the soil too open and hinders the working of the implements.

Of the nitrogenous commercial fertilizers, nitrate of soda is largely used. From 200 lb. to 400 lb. per acre are applied in four equal dressings. The first application should be made broadcast just before seeding, and mixed with the surface soil by harrowing. The other dressings are made by a drill at intervals throughout the growing season.

To supply potash, wood-ashes are frequently used. Ashes are applied in the fall, winter, or early spring, and should be harrowed in, at a rate of about $1\frac{1}{2}$ tons per acre. Either the muriate or sulphate of potash may be used. Bone-meal or other phosphates are beneficial if phosphoric acid is required.

Each grower should study the requirements of his soil. A few experiments should be made before applying commercial fertilizers to any large extent.

PREPARATION OF SOIL.

Fall ploughing is preferable in most places, as it gives the vegetable matter a better chance to decay, and the alternate freezing and thawing pulverizes the soil. The ground can usually be worked earlier in the spring, which is generally of great advantage. No labour should be spared in putting the soil in a fine condition. It should be harrowed four or five times and rolled two or three times, depending, of course, on the natural firmness of the soil. A plank drag is a very good implement to level the surface and make it smooth for planting. It is very important to have the ground firm and smooth on top and free from sticks, stones, etc.

SOWING THE SEED.

As soon as the land can be prepared in the spring the seed should be sown. The distance between the rows should depend somewhat on the variety grown, but for ordinary purposes the seed should be sown in rows 14 or 15 inches apart and covered about 1 inch deep. Where the horse-cultivator is to be used or where irrigation is practised, it is advisable to plant two rows close together, about 10 inches apart, and the next two rows far enough apart for the horse-cultivator to work, about 24 to 26 inches. If the soil is rich and in good condition, about $3\frac{1}{2}$ lb. of seed per acre is sufficient; but if the soil is not extra rich, or if there is danger of much loss from depredations of the cutworm or onion-maggot, more than this amount should be used. More seed than is necessary should not be used, as the work of thinning onions on a large scale is rather an expensive operation. It is important to have the seed sown in straight rows. Crooked rows are not only harder to cultivate, but are always an eyesore.

On low soils which are not well drained it is often desirable to sow the seed on raised beds about 3 or 4 feet wide. Sowing on the level is the usual practice in well-drained soils.

CULTIVATION AND WEEDING.

Cultivation should begin as soon as the location of the rows can be determined. If it is necessary to run the wheel-hoe before the onions are up, you can generally see the mark left by the roller of the seed-drill. The ground should be stirred frequently by means of the wheel-hoe, which straddles the row of onions, leaving only about $1\frac{1}{2}$ inches wide to weed by hand. It is always desirable to stir the surface of the ground as soon as possible after a rain, to prevent the formation of a crust on the surface. The weeds in between the plants in the rows can be pulled when necessary. If the wheel-hoe is carefully used the expense of hand-weeding is lessened considerably.

In cultivating onions the earth should be hoed away from, rather than towards, the plants.

THINNING.

About the time of the second weeding by hand the onions should be thinned to about 1 inch apart in the rows. Where the climate and soil are favourable for the growing of onions, there is no need of thinning more than this. Onions have the quality of crowding out to the sides, so that they may grow close together and still be of good size.

IRRIGATION.

Where irrigation is practised, care should be taken not to apply too much water. When the plants are in need of water, apply in alternate rows, giving the ground a fair soaking, and then shut off the water, so that the sun can do its part. Cultivation should follow each irrigation as soon as the soil is dry enough. Do not irrigate late in the season or you will have difficulty in maturing the crop.

HARVESTING.

If the onion-tops do not all fall down flat on the ground at the proper time about the middle of August to middle of September, it is good practice to go over the patch and pound the upright ones down.

Harvesting should commence as soon as most of the necks have turned yellow and are considerably wilted. Do not delay harvesting simply because there may be some green tops when the main crop is ready. If left too long the bulbs are liable to make new roots, especially if the weather is damp, and the quality of the onion is injured. Pull the onions by hand and deposit them in windrows containing the onions from three or four rows. If they are taken out with rakes they are apt to be bruised, and thus will not keep as well. The crop is left in the windrows until fully cured, which takes about ten days in good weather. During this time they should be topped with knives, cutting the tops off about $\frac{1}{2}$ inch from the bulb. On bright days the curing will be hastened by stirring with a wooden rake, being careful not to bruise the bulbs. If there is danger of a rainy season, the onions may be cured in open sheds or on the barn-floor. After the crop is cured the bulbs should be sorted and properly stored.

All weeds and refuse should be removed from the field, and, if possible, a fall crop grown.

MARKETING.

Onions should be sold as soon as a fair price can be obtained, and not stored for the winter unless there is a very good chance of a rise. If you have an extra favourable season, they may be shipped right from the field, but it is generally advisable to empty them out in open sheds and pick them over again. All the small onions should be picked out and sold separately for pickling purposes.

WINTER STORING.

It is not advisable for the inexperienced grower to try winter storing. Unless thoroughly cured, many bulbs will sprout, while others with only a slight bruise will decay. There will be more or less shrinkage, and a large percentage of the onions will be lost if proper care is not given to ventilating and maintaining the desired temperature. However, it is desirable that growers should understand the conditions necessary to keep onions through the winter months, so that they might store part of their crop. I would not advise storing very many unless one has extra good facilities for doing so. It is essential that the bulbs should be well matured, thoroughly cured, not bruised, and in a perfectly dormant state for successful winter storing.

Onions may be wintered by two different processes—namely, by freezing the bulbs and keeping them in this condition all winter, or by storing them in a dry apartment where the temperature can be maintained just above the freezing-point.

The former method is very satisfactory where the weather is cold during the entire winter. The onions are placed in a barn or outbuilding and allowed to freeze. They are then covered with hay, straw, or bags, and are allowed to remain in this frozen state all winter. The covering should not be removed in the spring until the bulbs are entirely thawed out. The temperature should not run above 32° or below 15° Fahr. Successive freezing and thawing or severe freezing will injure the bulbs. This method is not very successful in this Province.

The second method of storing onions is perhaps the safest where one has a good, dry, easily ventilated building. The bulbs are laid out on shelves, and thus can be picked over occasionally. The temperature should be kept above the freezing-point.

As onions cannot be fed to stock, it is not well to have too many on hand in the spring.

ENEMIES OF THE ONION.

The most important enemies of the onion are the onion-maggot, onion-smut, and cutworms.

The onion-maggot is a very destructive insect. The eggs are deposited on the plants near the ground and require about two weeks to hatch. After the egg hatches, the larvæ burrow into the bulb, where they remain for about two weeks, then emerge, pupate in the ground, and the adult insects deposit their eggs for another generation. The larvæ cause the plants to turn yellow in colour, wither, and finally die before the bulbs have matured. The only satisfactory preventive measure known yet is the planting on a new location each year.

The onion-smut attacks the young plants, causing the formation of dark spots or lines on the leaves. As the onion seedling develops, these spots

crack open, exposing a black powdery mass which contains the spores of the fungus. The disease when very severe causes the tops to wither and die, and then often spreads to the bulbs. As a preventive, all the refuse on the field should be burned immediately after the crop has been harvested. Adherence to a strict system of crop-rotation is the most practical preventive against this disease. A mixture of equal parts of sulphur and lime, sown in the drills with the seed, is very good.

The best remedy for cutworms is poisoned bran at the rate of 50 lb. bran to 1 lb. paris green. Mix dry and dampen with some sweetened water. Apply this in the evening, alongside the row. The cutworm has probably done more damage to onions in this Province than any other pest.

Victoria, B.C., December, 1912.

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